

Troubleshoot SD-WAN Control Connections

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Introduction

This document describes some of the probable causes that lead to a problem with Control Connections and how to troubleshoot them.

Background Information

 **Note:** Most of the command outputs presented in this document are from vEdge routers. However, the approach is the same for routers that run Cisco IOS® XE SD-WAN software. Enter the `sdwan` keyword in order to get the same outputs on Cisco IOS XE SD-WAN software. For example, `show sdwan control connections` instead of `show control connections`.

Before you troubleshoot, ensure that the WAN Edge that is in question has been configured properly.

It includes:

- A valid certificate that is installed.
- These configurations are put in place under the `system` block:
 - System-IP
 - Site-ID
 - Organization-Name
 - vBond address
- VPN 0 Transport interface that is configured with the Tunnel option and IP address.

- System Clock that is configured correctly on the vEdge and those that match with other devices/controllers:

The `show clock` command confirms the current time set.

Enter the `clock set` command in order to set the correct time on the device.

For all the cases mentioned earlier, ensure that Transport Locator (TLOC) is up. Check this with the `show control local-properties` command.

An example of a valid output is shown here:

```
<#root>
```

```
branch-vE1#
```

```
show control local-properties
```

```

personality                vedge
organization-name         vIPtela Inc Regression
certificate-status         Installed
root-ca-chain-status      Installed

certificate-validity       Valid
certificate-not-valid-before Sep 06 22:39:01 2018 GMT
certificate-not-valid-after  Sep 06 22:39:01 2019 GMT

dns-name                   vbond-dns-name.cisco.com
site-id                    10
domain-id                  1
protocol                   dtls
tls-port                   0
system-ip                  10.1.10.1
chassis-num/unique-id     66cb2a8b-2eeb-479b-83d0-0682b64d8190
serial-num                 12345718
vsmart-list-version       0
keygen-interval            1:00:00:00
retry-interval             0:00:00:17
no-activity-exp-interval  0:00:00:12
dns-cache-ttl              0:00:02:00
port-hopped                TRUE
time-since-last-port-hop  20:16:24:43
number-vbond-peers        2

```

```

INDEX  IP                PORT
-----
0      10.3.25.25       12346
1      10.4.30.30       12346

```

```
number-active-wan-interfaces 2
```

| PUBLIC INTERFACE | PUBLIC IPv4 | PRIVATE PORT | PRIVATE IPv4 | PORT | VS/VM COLOR | RESTRICT/ CARRIER | STATE | LAST CONTROL | MAX CONNEC |
|---------------------|----------------|-----------------|-----------------|-------|----------------|----------------------|-------|-----------------|---------------|
| ge0/1 | 10.1.7.11 | 12346 | 10.1.7.11 | 12346 | 2/1 gold | default | up | no/yes | 0:00 |
| ge0/2 | 10.2.9.11 | 12366 | 10.2.9.11 | 12366 | 2/0 silver | default | up | no/yes | 0:00 |

In vEdge software Version 16.3 and later, the output has a few additional fields:

```
number-vbond-peers          1
number-active-wan-interfaces 1
```

NAT TYPE: E -- indicates End-point independent mapping
A -- indicates Address-port dependent mapping
N -- indicates Not learned
Note: Requires minimum two vbonds to learn the NAT type

| INTERFACE | PUBLIC IPv4 | PUBLIC PORT | PRIVATE IPv4 | PRIVATE IPv6 | PRIVATE PORT | VS/VM | COLOR | MAX STATE CN |
|-----------|-------------|-------------|--------------|------------------------|--------------|-------|-----------------|--------------|
| ge0/4 | 172.16.0.20 | 12386 | 192.168.0.20 | 2601:647:4380:ca75::c2 | 12386 | 2/1 | public-internet | up 2 |

Problem Scenarios

DTLS Connection Failure (DCONFAL)

This is one of the common issues of control connectivity that does not come up. Probable causes include a firewall or some other connectivity issues.

It could be that some or all packets are dropped/filtered somewhere. The example with larger ones is given `intcpdump` results here.

- The next hop (NH) router is not reachable.
- The default gateway is not installed in the Routing Information Base (RIB).
- The Datagram Transport Layer Security (DTLS) port is not open in the controllers.

These show commands can be used:

```
<#root>
```

```
#Check that Next hop
```

```
show ip route vpn 0
```

```
#Check ARP table for Default GW
```

```
show arp
```

```
#Ping default GW
```

```
ping <...>
```

```
#Ping Google DNS
```

```
ping 8.8.8.8
```

```
#Ping vBond if ICMP is allowed on vBond
```

```
ping <vBond IP>
```

```
#Traceroute to vBond DNS
```

```
traceroute <...>
```

When you have a DTLS connection failure, you can see it in the `show control connections-history` command output.

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|-----------|-----------|-----------------|-------------------|----------------|
| 0 | vsmart | tls | 10.0.1.5 | 160000000 | 1 | 10.0.2.73 | 23456 | 10.0.2.73 |

This is what happens when large packets do not reach vEdge when you use `tcpdump`, for example on the SD-WAN (vSmart) side:


```
tcpdump vpn 0 interface eth1 options "host 198.51.100.162 -n"
```

```
13:51:35.312109 IP 198.51.100.162.9536 > 172.18.10.130.12546: UDP, length 140 <<<< 1 (packet number)
13:51:35.312382 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 1024 <<< not reached vEdge
13:51:35.318654 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 1024 <<< not reached vEdge
13:51:35.318726 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 853 <<< not reached vEdge
13:51:36.318087 IP 198.51.100.162.9536 > 172.18.10.130.12546: UDP, length 140 <<<< 5
13:51:36.318185 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 79 <<<< 6
13:51:36.318233 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 1024 << not reached vEdge
13:51:36.318241 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 879 << not reached vEdge
13:51:36.318257 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 804 << not reached vEdge
13:51:36.318266 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 65 <<<< 10
13:51:36.318279 IP 172.18.10.130.12546 > 198.51.100.162.9536: UDP, length 25 <<<< 11
```

An example of the vEdge side is shown here:

```
tcpdump vpn 0 interface ge0/1 options "host 203.0.113.147 -n"
```

```
13:51:35.250077 IP 198.51.100.162.12426 > 203.0.113.147.12746: UDP, length 140 <<<< 1
13:51:36.257490 IP 198.51.100.162.12426 > 203.0.113.147.12746: UDP, length 140 <<<< 5
13:51:36.325456 IP 203.0.113.147.12746 > 198.51.100.162.12426: UDP, length 79 <<<< 6
13:51:36.325483 IP 203.0.113.147.12746 > 198.51.100.162.12426: UDP, length 65 <<<< 10
13:51:36.325538 IP 203.0.113.147.12746 > 198.51.100.162.12426: UDP, length 25 <<<< 11
```

 **Note:** On Cisco IOS XE SD-WAN software, you can use Embedded Packet Capture (EPC) instead of `tcpdump`.

You can use `traceroute` or `nping` utilities as well in order to generate traffic with different packet sizes and Differentiated Services Code Point (DSCP) marks in order to check connectivity because your service provider can have problems with the delivery of larger UDP packets, fragmented UDP packets (especially UDP small fragments) or DSCP marked packet. Here is an example with `nping` when connectivity is successful.

From vSmart:

```
<#root>
vSmart#
```

```
tools nping vpn 0 198.51.100.162 options "--udp -p 12406 -g 12846 --source-ip 172.18.10.130 --df --data-
```

Nping in VPN 0

Starting Nping 0.6.47 (<http://nmap.org/nping>) at 2019-05-17 23:28 UTC

SENT (0.0220s) UDP 172.18.10.130:12846 > 198.51.100.162:12406 ttl=64 id=16578 iplen=583

SENT (1.0240s) UDP 172.18.10.130:12846 > 198.51.100.162:12406 ttl=64 id=16578 iplen=583

An example from vEdge is shown here:

```
<#root>
```

```
vEdge#
```

```
tcpdump vpn 0 interface ge0/1 options "-n host 203.0.113.147 and udp"
```

```
tcpdump -i ge0_1 -s 128 -n host 203.0.113.147 and udp in VPN 0
```

```
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
```

```
listening on ge0_1, link-type EN10MB (Ethernet), capture size 128 bytes
```

```
18:29:43.492632 IP 203.0.113.147.12846 > 198.51.100.162.12406: UDP, length 555
```

```
18:29:44.494591 IP 203.0.113.147.12846 > 198.51.100.162.12406: UDP, length 555
```

And here is an example of unsuccessful connectivity with the `traceroute` command (that runs from vShell) on vSmart:

```
<#root>
```

```
vSmart$
```

```
traceroute 198.51.100.162 1400 -F -p 12406 -U -t 192 -n -m 20
```

```
traceroute to 198.51.100.162 (198.51.100.162), 20 hops max, 1400 byte packets
```

```
 1 * * *
 2 * * *
 3 * * *
 4 * * *
 5 * * *
 6 10.65.14.177 0.435 ms 10.65.13.225 0.657 ms 0.302 ms
 7 10.10.28.115 0.322 ms 10.93.28.127 0.349 ms 10.93.28.109 1.218 ms
 8 * * *
 9 * * *
10 * 10.10.114.192 4.619 ms *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 10.68.72.61 2.162 ms * *
17 * * *
18 * * *
19 * * *
20 * * *
21 * * *
22 * * *
23 * * *
24 * * *
25 * * *
```

```

26 * * *
27 * * *
28 * * *
29 * * *
30 * * *

```

vEdge does not receive packets sent from vSmart (only some other traffic or fragments):

```
<#root>
```

```
vEdge#
```

```
tcpdump vpn 0 interface ge0/1 options "-n host 203.0.113.147 and udp"
```

```

tcpdump -i ge0_1 -s 128 -n host 203.0.113.147 and udp in VPN 0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ge0_1, link-type EN10MB (Ethernet), capture size 128 bytes
18:16:30.232959 IP 203.0.113.147.12846 > 198.51.100.162.12386: UDP, length 65
18:16:30.232969 IP 203.0.113.147.12846 > 198.51.100.162.12386: UDP, length 25
18:16:33.399412 IP 203.0.113.147.12846 > 198.51.100.162.12386: UDP, length 16
18:16:34.225796 IP 198.51.100.162.12386 > 203.0.113.147.12846: UDP, length 140
18:16:38.406256 IP 203.0.113.147.12846 > 198.51.100.162.12386: UDP, length 16
18:16:43.413314 IP 203.0.113.147.12846 > 198.51.100.162.12386: UDP, length 16

```

TLOC Disabled (DISTLOC)

Triggers to TLOC Disabled messages can be due to these probable causes:

- Clear Control Connections.
- Change the color on TLOC.
- Change in the System IP.

Change in any of the configurations mentioned in the system block or in the tunnel properties in the `show control connections-history` command output.

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|------------------|
| vmanage | dtls | 192.168.30.101 | 1 | 0 | 192.168.20.101 | 12346 | 192.168.20.101 | 12346 |
| vsmart | dtls | 192.168.30.103 | 1 | 1 | 192.168.20.103 | 12346 | 192.168.20.103 | 12346 |
| vbond | dtls | 0.0.0.0 | 0 | 0 | 192.168.20.102 | 12346 | 192.168.20.102 | 12346 |

Board-ID not Initialized (BIDNTPR)

In a highly unstable network, where network connections flap continuously, you can see TXCHTOBD - failed to send a challenge to Board ID failed and/or RDSIGFBD - Read Signature from Board ID failed. Also, sometimes due to lock issues, a challenge sent to board-id fails and when that happens, reset the board-ID and try again. It does not happen often, and it delays the form of control connections. This is fixed in later versions.

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|------------------|
| vbond | dtls | - | 0 | 0 | 203.0.113.109 | 12346 | 203.0.113.109 | 12346 |
| vbond | dtls | - | 0 | 0 | 203.0.113.56 | 12346 | 203.0.113.56 | 12346 |

BDSGVERFL - Board ID Signature Failure

This indicates that the vEdge chassis-num/unique-id/serial number is rejected by the vBond. When this occurs, confirm the vEdge information shown in the `show control local-properties` command output and compare that output to `show orchestrator valid-vedges` on the vBond.

If an entry does not exist for the vEdge, ensure that you have:

- Added the vEdge to the smart account.
- Uploaded that file correctly to vManage.

Click **Send to Controllers** under **Configuration > Certificates**.

If it does exist, check for duplicate entries in the valid-vEdge table and engage the Cisco Technical Assistance Center (TAC) to troubleshoot this further

Stuck in 'Connect': Routing Issues

Control connections do not come up if there are routing issues in the network. Ensure that there is a valid route in the RIB with the correct NH/TLOC.

Examples include:

- A more specific route to vBond in the RIB points to an NH/TLOC which is not used to establish control connections.
- TLOC IP is leaked between the upstream service provider which causes incorrect routing.

Enter these commands for verification:

```
show ip route
show ip routes vpn 0 <prefix/mask>
ping <vBond IP>
```

Look for the distance value and the protocol for the IP-Prefix.

vEdge tries to establish a control connection with no success or connections to controllers keep flapping.

Verify with the `show control connections` and/or the `show sdwan control connections-history` commands.

```
<#root>
```

```
vedge1#
```

```
show control connections
```

| PEER TYPE | PEER PROT | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIV PORT | PEER PUBLIC IP |
|-----------|-----------|----------------|---------|-----------|-----------------|----------------|----------------|
| vbond | dtls | 0.0.0.0 | 0 | 0 | 192.168.20.102 | 12346 | 192.168.20. |

Socket Errors (LISFD)

If there is a duplicate IP in the network, control connections do not come up. You see the LISFD - Listener Socket FD Error message. This can happen for other reasons as well, such as packet corruption, a RESET, a mismatch between vEdge and controllers on TLS versus DTLS ports, if the FW ports are not open, and so on.

The most common cause is a duplicate transport IP. Check connectivity and ensure that the addresses are unique.

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| vbond | dtls | - | 0 | 0 | 203.0.113.21 | 12346 | 203.0.113.21 |

Peer Timeout Issue (VM_TMO)

A peer timeout condition is triggered when a vEdge loses reachability to the controller in question.

In this example, it captures avManage Timeout msg (peer VM_TMO). Others include peer vBond, vSmart and/or vEdge timeouts (VB_TMO, VP_TMO, VS_TMO).

As part of troubleshooting, ensure that you have connectivity to the controller. Use Internet Control Message Protocol (ICMP) and/or traceroute to the IP address in question. Cases where there are lots of traffic drops (loss is high). Rapid ping and ensure that it is good.

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| vmanage | tls | 10.0.1.3 | 3 | 0 | 10.0.2.42 | 23456 | 203.0.113.124 |

In addition, check the show control connections-history detail command output in order to look at the TX/RX control statistics to see if there is any significant discrepancy in the counters. Notice in the output the difference between RX and TX hello packet numbers.

```
-----
LOCAL-COLOR- biz-internet SYSTEM-IP- 192.168.30.103 PEER-PERSONALITY- vsmart
-----
```



```

site-id          1
domain-id       1
protocol        dtls
private-ip      192.168.20.103
private-port    12346
public-ip       192.168.20.103
public-port     12346
UUID/chassis-number 4fc4bf2c-f170-46ac-b217-16fb150fef1d
state           tear_down [Local Err: ERR_DISABLE_TLOC] [Remote Err: NO_ERROR]
downtime        2019-06-01T14:52:49+0200
repeat count    5
previous downtime 2019-06-01T14:43:11+0200

```

Tx Statistics-

```

-----
hello           597
connects        0
registers        0
register-replies 0
challenge        0
challenge-response 1
challenge-ack    0
teardown        1
teardown-all    0
vmanage-to-peer 0
register-to-vmanage 0

```

Rx Statistics-

```

-----
hello           553
connects        0
registers        0
register-replies 0
challenge        1
challenge-response 0
challenge-ack    1
teardown        0
vmanage-to-peer 0
register-to-vmanage 0

```

Serial Number(s) not Present (CRTREJSER, BIDNTVRFD)

If the serial number is not present on the controllers for a given device, the control connections fail.

It can be verified with `show controllers [valid-vsmarts | valid-vedges]` outputs and fixed most of the time. Navigate to **Configuration > Certificates > Send to Controllers** or **Send to vBond** buttons from the vManage tabs. On vBond, check `show orchestrator valid-vedges / show orchestrator valid-vsmarts`.

In the logs on vBond you observe these messages with reason `ERR_BID_NOT_VERIFIED`:

```

messages:local7 info: Dec 21 01:13:31 vBond-1 VBOND[1677]: %Viptela-vBond-1-vbond_0-6-INFO-1400002: Not
y-level:major host-name:"vBond-1" system-ip:10.0.1.11 uuid:"110G301234567" organization-name:"Example_0

```

When you troubleshoot such a problem, ensure that the correct serial number and device model was configured and provisioned on the PnP portal (software.cisco.com) and vManage.

In order to check the chassis number and the certificate serial number, this command can be used on vEdge routers:

```
<#root>
vEdge1#
show control local-properties | include "chassis-num|serial-num"

chassis-num/unique-id      110G528180107
serial-num                  1001247E
```

On a router that runs Cisco IOS XE SD-WAN software, enter this command:

```
<#root>
cEdge1#
show sdwan control local-properties | include chassis-num|serial-num

chassis-num/unique-id      C1111-4PLTEEA-FGL223911LK
serial-num                  016E9999
```

Or this command:

```
<#root>
Router#
show crypto pki certificates CISCO_IDEVID_SUDI | s ^Certificate

Certificate
  Status: Available
  Certificate Serial Number (hex): 016E9999
  Certificate Usage: General Purpose
  Issuer:
    o=Cisco
    cn=High Assurance SUDI CA
  Subject:
    Name: C1111-4PLTEEA
    Serial Number: PID:C1111-4PLTEEA SN:FGL223911LK
    cn=C1111-4PLTEEA
    ou=ACT-2 Lite SUDI
    o=Cisco
    serialNumber=PID:C1111-4PLTEEA SN:FGL223911LK
  Validity Date:
    start date: 15:33:46 UTC Sep 27 2018
    end date: 20:58:26 UTC Aug 9 2099
  Associated Trustpoints: CISCO_IDEVID_SUDI
```

For Issues with vEdge/vSmart

Here is how the error looks on vEdge/vSmart in the `show control connections-history` command output:

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|------------------|
| vbond | dtls | 0.0.0.0 | 0 | 0 | 192.168.0.231 | 12346 | 192.168.0.231 | 12346 |

On vBond in the `show orchestrator connections-history` command output:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| 0 | unknown | dtls | - | 0 | 0 | :: | 0 | 192.168.1 |

Also, the device serial number on vBond is not in the list of valid vEdges:

```
<#root>
```

```
vbond1#
```

```
show orchestrator valid-vedges | i 110G528180107
```

For Issues with Controllers

If the serial file between the controllers itself does not match, the local error on vBond is the serial number that is not present versus the certificate revoked for vSmarts/vManage.

On vBond:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| 0 | unknown | dtls | - | 0 | 0 | :: | 0 | 192.168.0 |

```
<#root>
```

```
vbond1#
```

```
show orchestrator valid-vsmarts
```

| SERIAL NUMBER | ORG |
|---------------|------------------|
| 0A | SAMPLE - ORGNAME |
| 0B | SAMPLE - ORGNAME |
| 0C | SAMPLE - ORGNAME |

OD SAMPLE - ORGNAME

On affected vSmart/vManage:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| 0 | vbond | dtls | 0.0.0.0 | 0 | 0 | 192.168.0.231 | 12346 | 192.168.0.231 |

<#root>

vsmart#

show control local-properties | i serial-num

serial-num 0F

Also, you see ORPTMO messages on the affected vSmart with regards to vEdge:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| 0 | unknown | tls | - | 0 | 0 | :: | 0 | 192.168.10.238 |
| 0 | unknown | tls | - | 0 | 0 | :: | 0 | 192.168.10.238 |
| 0 | unknown | tls | - | 0 | 0 | :: | 0 | 198.51.100.100 |
| 0 | unknown | tls | - | 0 | 0 | :: | 0 | 198.51.100.100 |
| 0 | unknown | tls | - | 0 | 0 | :: | 0 | 192.168.10.240 |

On vEdge affected vSmart, in the show control connections-history output the "SERNTPRES" error is seen:

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|------------------|
| vsmart | tls | 10.10.10.229 | 1 | 1 | 192.168.0.229 | 23456 | 192.168.0.229 | 23456 |
| vsmart | tls | 10.10.10.229 | 1 | 1 | 192.168.0.229 | 23456 | 192.168.0.229 | 23456 |

Wrong Chassis-Num/Unique-Id

Another example of the same error "CRTREJSER/NOERR" can be seen if the wrong Product ID (model) is used on the PnP portal. For example:

<#root>

vbond#

```
show orchestrator valid-vedges | include ASR1002
```

```
ASR1002-HX-DNA-JAE21050110          014EE30A          valid      Cisco SVC N1
```

However, the real device model is different (note that "DNA" postfix is not in the name):

<#root>

ASR1k#

```
show sdwan control local-properties | include chassis-num
```

```
chassis-num/unique-id          ASR1002-HX-JAE21050110
```

Organization Mismatch (CTORGNMMIS)

Organization Name is a critical component for bring up of the control connection. For a given overlay, the Organization name has to match across all the controllers and vEdges so that control connections can come up.

If not, there is a "Certificate Org. name mismatch" error as shown here:

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM | IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|-------------|----|---------|-----------|-----------------|-------------------|----------------|------------------|
| vbond | dtls | - | | 0 | 0 | 203.0.113.197 | 12346 | 203.0.113.197 | 12346 |
| vbond | dtls | - | | 0 | 0 | 198.51.100.137 | 12346 | 198.51.100.137 | 12346 |

vEdge/vSmart Certificate Revoked/Invalidated (VSCRTREV/CRTVERFL)

In cases when the certificate is revoked on controllers or vEdge serial number is invalidated, a vSmart or vEdge Certification revoked message, respectively, is displayed.

Here are example outputs of vSmart Certificate revoke messages. This is the certificate that is revoked on vSmart:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM | IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|----------|-----------|---------------|-------------|----|---------|-----------|-----------------|-------------------|----------------|------------------|
| 0 | vbond | dtls | 0.0.0.0 | | 0 | 0 | 192.168.0.231 | 12346 | 192.168.0.231 | |
| 1 | vbond | dtls | 0.0.0.0 | | 0 | 0 | 192.168.0.231 | 12346 | 192.168.0.231 | |

Likewise, on another vSmart in the same overlay, this is how it sees the vSmart whose certificate is revoked:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| 0 | vsmart | tls | 10.10.10.229 | 1 | 1 | 192.168.0.229 | 23456 | 192.168.0.229 |

And here is how vBond sees this:

| INSTANCE | PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|----------|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| 0 | vsmart | dtls | 10.10.10.229 | 1 | 1 | 192.168.0.229 | 12346 | 192.168.0.229 |

Certification verification failure is when the certificate cannot be verified with the root certificate installed:

1. Check the time with the `show clock` command. It must be at least within vBond certificate validity range (check with the `show orchestrator local-properties` command).
2. This can be caused by root certificate corruption on vEdge.

Then `show control connections-history` command on the vEdge router shows a similar output:

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|
| vbond | dtls | - | 0 | 0 | 203.0.113.82 | 12346 | 203.0.113.82 |
| vbond | dtls | - | 0 | 0 | 203.0.113.81 | 12346 | 203.0.113.81 |

In this case, vEdge cannot validate the controller certificate as well. In order to fix this issue, you can reinstall the root certificate chain. In case the Symantec Certificate Authority is used, you can copy the Root certificate chain from the read-only filesystem:

```
<#root>
vEdge1#
vshell
vEdge1:~$
cp /rootfs ro/usr/share/viptela/root-ca-sha1-sha2.crt /home/admin/
vEdge1:~$
exit
vEdge1#
request root-cert-chain install /home/admin/root-ca-sha1-sha2.crt
```

```

Uploading root-ca-cert-chain via VPN 0
Copying ... /home/admin/root-ca-sha1-sha2.crt via VPN 0
Installing the new root certificate chain
Successfully installed the root certificate chain

```

vEdge Template not Attached in vManage

At the time the device is brought up if the device is not attached with a template on vManage, the **NOVMCFG - No Config in vManage for device** message is displayed.

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|------------------|
| vmanage | dtls | 10.0.1.1 | 1 | 0 | 10.0.2.80 | 12546 | 203.0.113.128 | 12546 |

Transient Conditions (DISCVBD, SYSIPCHNG)

Here are some transient conditions where the control connections flap. They include:

- System-IP changed on the vEdge.
- Tear-down message to vBond (control connection to vBond is transient).

| PEER TYPE | PEER PROTOCOL | PEER SYSTEM IP | SITE ID | DOMAIN ID | PEER PRIVATE IP | PEER PRIVATE PORT | PEER PUBLIC IP | PEER PUBLIC PORT |
|-----------|---------------|----------------|---------|-----------|-----------------|-------------------|----------------|------------------|
| vmanage | dtls | 10.0.0.1 | 1 | 0 | 198.51.100.92 | 12646 | 198.51.100.92 | 12646 |

DNS Failure

When no connection attempts are seen in the **show control connection-history** command, you can check for DNS resolution failure towards the vBond with these steps:

- Ping towards the DNS address of the vBond.

```

ping vbond-dns-name.cisco.com
ping vbond-dns-name.cisco.com: Temporary failure in name resolution

```

- Ping google DNS (8.8.8.8) from the source interface to verify internet reachability.

```

ping 8.8.8.8
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:

```

- Embedded Packet Capture for DNS traffic on port 53 to check for sent and received DNS traffic.

```
monitor capture mycap interface <interface that forms control>  
monitor capture mycap match ipv4 <source IP> <vBond IP>
```

Reference Document: [Embedded Packet Capture](#).

Start the monitor capture and let it run for a couple of minutes and then stop the capture. Proceed to examine the packet capture to see if DNS queries are sent and received.

Related Information

- [Configure Basic Parameters to Form Control Connections on cEdge](#)
- [Technical Support & Documentation - Cisco Systems](#)